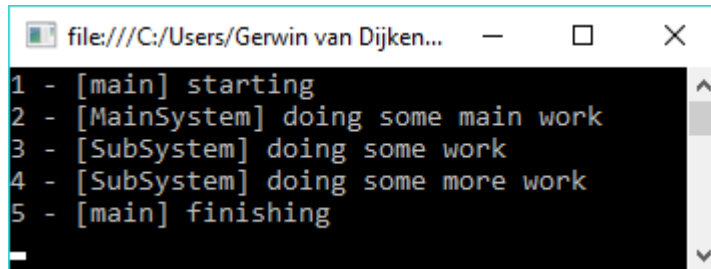


Assignment 1 ('Singleton Pattern')

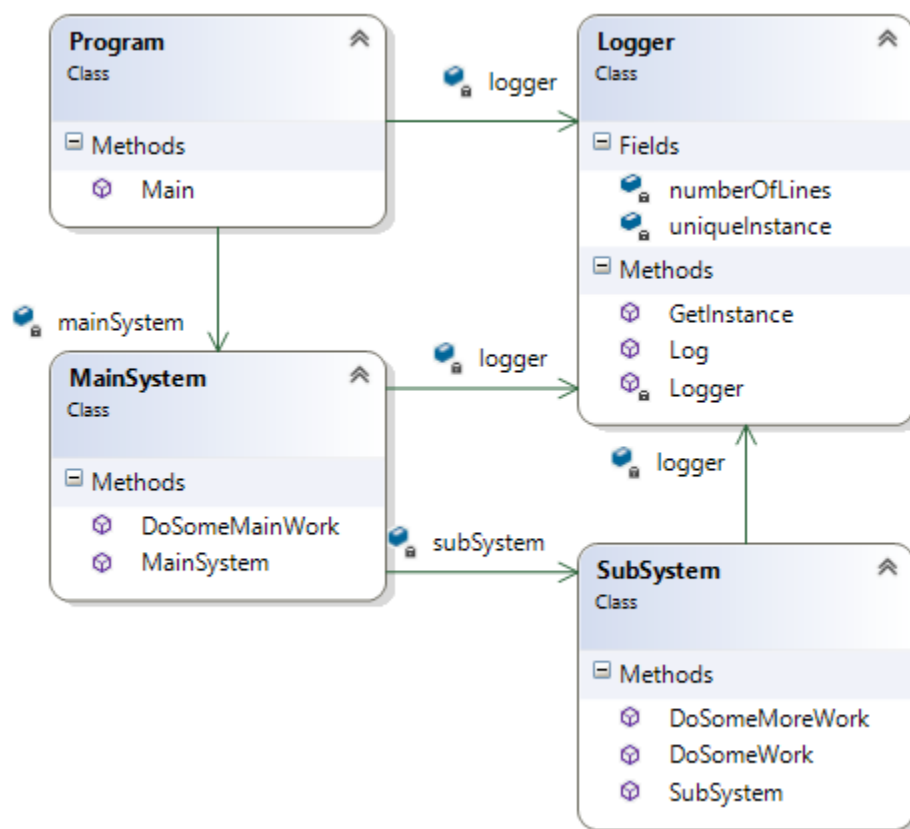
In an application logging is done at several places (in several classes) using a special Logger class. To save resources this Logger is implemented as a 'Singleton'. Each line in the log is preceded by a line number, starting at 1 and continuously increased by 1 when the next line is written (see screenshot below).



```
file:///C:/Users/Gerwin van Dijken...
1 - [main] starting
2 - [MainSystem] doing some main work
3 - [SubSystem] doing some work
4 - [SubSystem] doing some more work
5 - [main] finishing
```

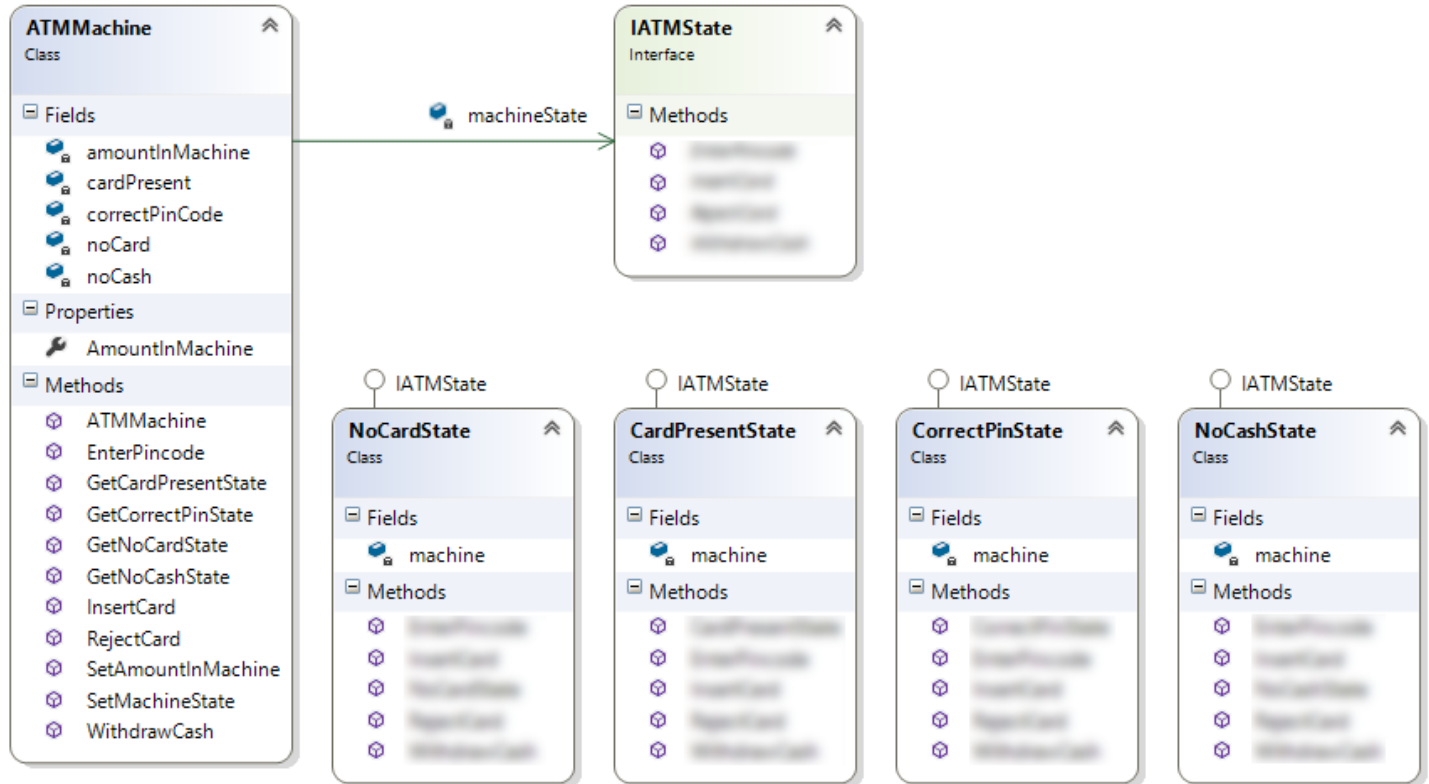
Implement the Logger class, a MainSystem class, a SubSystem class, and a simple Main/Start method that (together) generates the output shown above. The Main/Start method creates the MainSystem object, and calls the logger with: `logger.Log("main", "starting");` Do not pass the logger object around!

In the classdiagram you can see how the classes relate to each other.



Assignment 2 ('State Pattern')

Create an application with an ATM machine (cash dispenser) that has 4 different states: 1) no card present, 2) card present, 3) entered correct pincode and 4) no cash available. Use the 'state pattern' to implement the ATM machine and its states. Use the classdiagram below to implement the interface and classes.



Use the Main/Start code below, that generates the output shown to the right.

```

static void Main(string[] args) {
    Program myProgram = new Program();
    myProgram.Start();
}

void Start() {
    ATMMachine machine = new ATMMachine(2000);

    machine.InsertCard();
    machine.RejectCard();

    machine.InsertCard();
    machine.EnterPincode(1234);
    machine.WithdrawCash(1500);

    machine.InsertCard();
    machine.EnterPincode(1234);
    machine.WithdrawCash(750);

    Console.ReadKey();
}
  
```

```

file:///C:/Users/Gerwin van ...
Please enter your pincode
Your card has been rejected.
Please enter your pincode
You have entered the correct pincode.
1500 withdrawn from machine.
Your card has been rejected.
Please enter your pincode
You have entered the correct pincode.
Not enough cash available in machine.
Your card has been rejected.
  
```